

<b>Module:</b> Physical Organic Chemistry			
<b>University/department/institute:</b> Freie Universität Berlin/Department of Biology, Chemistry and Pharmacy/Institute of Chemistry and Biochemistry			
<b>Responsible for the module:</b> module lecturers			
<b>Admission requirements:</b> none			
<b>Qualification aims:</b> The students have deepened their understanding of physical organic chemistry. They can independently analyze unknown reaction mechanisms and find ways of explaining them; they are familiar with the relevant types of short-lived intermediates and have detailed knowledge of non-ionic reactions under orbital control. Their expanded knowledge of potential energy surfaces, thermodynamics and kinetics enables them to evaluate the chemical reactivity of organic molecules in detail. They understand the influence of the surrounding environment on molecular properties. In the accompanying seminar, students also investigate controversial cases from current research, present them and discuss them critically in the group.			
<b>Content:</b> Structure and bonding (frontier orbital methods, aromatics, non-aromatics, anti-aromatics); reaction coordinates (reaction dynamics, two-state reactivity); the relationship between thermodynamics and kinetics (the limits of Hammond's postulate, Hammett's Linear Free Energy Relationships, substituent effects); reaction mechanisms (short-lived intermediates and methods of proving them, pericyclic reactions and orbital control, carbenes, nitrenes, radicals, photochemistry); influences of the surrounding environment (solvation effects on acidities and nucleophiles, solvatochromism)			
Teaching and learning units	Attendance (Semester hours per week = SH)	Forms of active participation	Study time (hours)
Lecture	2	-	Attendance L 30 Preparation and follow-up L 30
Seminar	2	Lectures, working on problem sets, contributing to discussions	Attendance S 30 Preparation and follow-up S 30 Examination preparation, examination 30
<b>Language of instruction</b>		German or English	
<b>Compulsory regular attendance</b>		Attendance recommended	
<b>Study time, total hours</b>		150 hours	5 CP
<b>Duration of module</b>		One semester	
<b>Module offered</b>		Every summer semester	
<b>Application</b>		Master's program in Chemistry	